

The impact of COVID-19 on negative body image:

Evidence based on social media data

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Abstract

Objective: Body experiences and conditions are closely relevant to social development and human well-being. However, there is no consensus on the impact of COVID-19 on negative body image in previous studies.

Methods: To investigate the true relationship between COVID-19 and negative body image, this study has developed a dictionary of negative body image to obtain panel data on body image for 31 Chinese provinces/municipalities/autonomous regions from January 2010 to May 2022. We have compared negative body image in different years before and after the pandemic and explored the impact of pandemic severity on negative body image.

Results: The prevalence of negative body image significantly decreased following the outbreak and remained at a relatively low level for two years. After controlling for regional and temporal effects, epidemic severity was found to be a significant predictor of the decline in negative body image.

Limitations: The applicability of the negative body image dictionary beyond Chinese contexts and its efficacy in other countries or regions require further investigation.

Conclusions: The study suggests that the public is likely to adopt certain physical appearances during lockdown due to their fear of mortality and changes in lifestyle. This research has significant implications for comprehending the dynamic transformation of public body image under the influence of catastrophic public health events.

Keywords: Negative body image; COVID-19; Social media; Panel data analysis

1. Introduction

The World Health Organization (WHO) declared the international spread of novel coronavirus as a Public Health Emergency of International Concern (PHEIC) and named the disease COVID-19 in 2020 (World Health Organization, 2020). The outbreak of COVID-19 and subsequent changes in lifestyle have emerged as significant factors influencing psychological experiences and physical self-perception (Cullen et al., 2020; Robertson et al., 2021; Monteleone et al., 2021). During the pandemic, the human body has been closely monitored as a potential site for disease occurrence and viral transmission. In addition to the healthy functioning of the body, the issue of body image has also received widespread attention (Nolen et al., 2022). About one in five users reported increased scrutiny of body and eating behaviors during lockdown, and body dissatisfaction had a negative impact on daily life (Nutley et al., 2021).

Body image encompasses an individual's perception, thoughts, and emotions regarding their own physical appearance (Grogan, 2021), which can include both positive and negative evaluations (Cash, 2004; Grogan, 2010; Kling et al., 2019). Negative body image refers to the negative cognitive processes, emotional responses, and behaviors that individuals exhibit towards their bodies. This is often manifested through stereotyping as well as excessive evaluation of weight, body shape and food choices (Chen et al., 2006; Grogan, 2008).

Physical experiences and conditions have a profound influence on human development and life satisfaction (Cash, 2004). The negative body image is strongly linked to reduced happiness (Bucchianeri et al., 2016), diminished self-esteem (Davison & McCabe, 2006; Hutchinson & Calland, 2019), eating disorders (Westerberg-Jacobson et al., 2010; Piran, 2015; Voelker et al., 2015) and depression (Smolak & Thompson, 2002; Choukas-Bradley et al., 2022). One of the primary objectives of therapies for clinical eating disorders or subclinical dietary difficulties is to reduce body dissatisfaction (Fursland & Byrne, 2015). Investigating negative body image and its variations is advantageous in comprehending the overall state of mental health and preparing for unexpected abnormal changes caused by groups. Therefore, studying the development and alteration of negative body image holds great significance.

However, there is no consensus on the impact of COVID-19 on body image. Studies have indicated that stress and anxiety related to COVID-19 may contribute to negative body image (Swami et al., 2021) and dissatisfaction with one's own body (Robertson et al., 2021). The prevalence of video chatting may decrease satisfaction with one's own body (Pfund et al., 2020). Long-term exposure to cameras can increase physical appearance anxiety (Pikoos et al., 2021) and trigger or exacerbate various compensatory behaviors, such as excessive exercise, vomiting, and laxative use (Nutley et al., 2021). However, the evidence for this effect is not consistent. Subsequent research has revealed that there was no increase in negative body image or eating disorders among students during lockdown,

and female students actually experienced a slight increase in positive appearance evaluation (Baceviciene & Jankauskiene, 2021). Therefore, it is crucial to investigate COVID-19's true impact on negative body image in larger populations.

Negative body image is typically assessed using questionnaires (Chen et al., 2006; Nevill et al., 2015). However, the resource-intensive nature of traditional survey research limits participant numbers and reduces the representativeness of findings (Li et al., 2021).

This study utilized a panel data model in conjunction with large-scale microblog data to investigate the causal mechanism underlying the impact of pandemic severity on negative body image. Microblog is a social media platform that operates on the basis of user relationships. Since its inception in 2009, the number of microblog users has grown rapidly. As of Q3 2022, there were over 584 million monthly active microbloggers and more than 253 million daily active microbloggers, making it China's most influential social platform (source: <http://ir.weibo.com/>). The microblogging activists cover all ages and provinces in China, providing highly ecological, widely geographical, and representative panel data. This data is frequently used to investigate the causes of group psychology and track dynamic changes in public mental health (Han et al., 2021; Li et al., 2021). Panel data contains more information and richer variation sources, allowing for more effective and reliable parameter estimation (Chen, 2015). To fully leverage the benefits of social media corpus, we employ Panel Data Modeling in this study to establish causality from non-experimental data.

With the rapid development of computer science, computer-based text analysis programs have become a standardized method for psychological research (Tausczik & Pennebaker, 2010; Boyd et al., 2022). Big data psychological research compensates for the limitations of sample inference and provides a new perspective on standardizing psychology.

To fully exploit the power of big data analysis, this study compared negative body image before and after the COVID-19 pandemic in China and explored the impact of epidemic severity on negative body image by obtaining panel data on negative body image from tremendous microblog data. To fully harness the potential of big data analysis, this study conducted a comparative analysis on negative body image pre- and post-COVID-19 pandemic in China, while also exploring the impact of epidemic severity on negative body image through panel data obtained from vast microblogging sources.

2. Study 1

In Study 1, we constructed a negative body image dictionary to measure negative body image among Weibo users. We extracted words related to negative body image from authoritative questionnaires, and rated all words, excluding duplicates and low-frequency ones. The final dictionary contains 199 words with one dimension.

2.1 Method

Schilder (1935) proposed the concept of body image for the first time in his book *The Image and Appearance of the Human Body*, which defined it as "our own body which we form in our mind". Subsequently, Cash and Pruzinsky (2002) broadened the meaning of body image, expanding the term to include all aspects of self-perception and attitude toward one's physical appearance, including thoughts, beliefs, feelings, and behaviors. As more researchers went deep into the area, the definition of body image turned complex. Nowadays, body image is considered a multi-dimensional self-perception that encompasses appearance and physiological function rather than a single entity (Cash, 2012).

However, while researchers emphasize the importance of understanding body image from a broader perspective, the complex interpretation of body image may not reflect the concept of most ordinary people (Bailey et al., 2017). The mass media, which is easier to obtain than academic research that has undergone peer review, is likely to have an impact on how the general public views body image and weight (Karazsia et al., 2017). Individuals are prone to focus on weight, height, and appearance in the definition of body image (Tylka et al., 2015; Rodgers et al., 2016), which is different from positive body image that emphasizes the importance of body functionality (Cash, 2008; Tylka & Wood-Barcalow, 2015). This study concentrates on the negative component of body image, which refers to people's stereotyping and excessive focus on their physical appearance.

2.1.1 Dictionary construction

In order to study people's perception of body images in social media, this study constructed a negative body image dictionary through the following four steps (Fig. 1).

Selecting initial words. In accordance with standard dictionary compilation methods, we selected words related to negative body image from authoritative questionnaires and dictionaries (Pepe & Bollen, 2008; Dong et al., 2015). The questionnaires we utilized are commonly applied measuring negative body image, including Negative Physical Self Scale (NPSS, Chen et al., 2006), the Body Esteem Scale (BES, Franzoi & Shields, Multidimensional Body Self-Relations Questionnaire, MBSRQ, Nevill et al., 1984), Multidimensional Body Self-Relations Questionnaire, MBSRQ, Nevill et al., 2015), the Self-Objectification Questionnaire, SOQ, Noll & Fredrickson, 1998) and the Objectified Body Consciousness Scale (OBCS, McKinley & Hyde, 1996). Since the scales except for NPSS are all in English, we applied the equivalent Chinese versions for the rest questionnaires. (BES, He, Zhang, 2002; MBSRQ, Ma et al., 2008; SOQ, Jiang, Chen, 2019; OBCS, Zheng, 2015). Combined with body words in Simplified Chinese Language Inquiry and Word Count dictionary (SCLWC, Zhao et al., 2016), 546 words related to negative body image were obtained from the above sources.

Filtering out irrelevant words. The words selected in step one are rated by five psychology professionals. The rating is "pass" provided that the word is associated with negative body image, which means it conveys people's stereotyping and overemphasis on their physical appearance; otherwise, the rating is "fail". The words that passed three times were kept in the list. 172 words remained after 374 irrelevant words were moved.

Expanding remaining words. We artificially added as many synonyms as possible based on the existing dictionary. Five psychological professionals were asked to evaluate the augmented words, with a pass rate of more than 50% retained. The expanded dictionary contains 260 key words in total.

Remove low frequency words and repeated words. To evaluate the ecological validity of the dictionary, we calculated the frequency of each word appearing in the microblog database.

Based on posts of microblogging activists between January 2010 to May 2022, we created a microblog database around 31 Chinese provinces/municipalities/autonomous regions using the public API. While downloading the post, we set the necessary filtering conditions to guarantee the validity of the content. First, we selected relatively microblogging activists with accounts that have been registered for more than a year and have at least 500 tweets. Second, we narrowed the samples to accounts with less than 3,000 followers since the study is focused on regular users rather than celebrities, professional bloggers, or other organizations. In addition, we removed the retweets and kept the downloaded sample original since the retweets are not users' self-expressions.

We randomly took 1/10,000th of the content from the microblog database and calculated the frequency of dictionary words appearing. We removed low-frequency words such as “皮相 (appearance of skin)” and “脚踝 (ankle)” which are too formal and rarely appear in the microblog. After removing irrelevant and repetitive words, the updated dictionary contains 199 words with a single dimension.

2.1.2 Validity analysis

(i) A measure of negative body image

We obtained negative body image data from the microblog database using word frequency analysis method. The microblog database includes posts of microblogging activists in 31 Chinese provinces/ municipalities/autonomous regions from January 2010 to May 2022. First, we employed the "TextMind" system developed by the Computational CyberPsychology Laboratory at the Institute of Psychology, Chinese Academy of Sciences, for word segmentation and frequency calculation of microblog posts. The system is able to segment the text into separate words with linguistic features based on Chinese grammatical rules. We then used the negative body image dictionary to calculate the word frequency of negative body image words in each region, which is represented by the number of words in dictionary divided by the total number of posts words. The word frequency describes the level of negative body image in different regions at different times. Following this treatment, data of

negative body image in 31 Chinese provinces/ municipalities/autonomous regions from January 2010 to May 2022 were obtained in the study.

(ii) Validity analysis program

To explore whether the word frequency truly reflects the general public's negative body image, we calculated the consistency of the word frequency with the manual ratings. We randomly selected 50 microblog posts from the microblog database for evaluation. We then used 5-point Likert Scale score (1 = strongly disagree, 3 = neither agree nor disagree, 5 = strongly agree) to assess whether a post expresses user stereotypes and excessive concern about appearance. Five psychological experts separately assessed the level of negative body image in the 50 microblog posts.

To further evaluate the validity, another 500 microblog texts were randomly selected from the microblog text database. The level of presenting negative body image in the texts was rated by five psychology professionals. We used the negative body image dictionary for word frequency analysis and calculated the Pearson correlation between the score and word frequency for each text.

2.2 Result

Fig. 1 depicts the monthly change in negative body image from January 2010 to May 2022 in 31 provinces/ municipalities/autonomous regions. It indicates that the local maxima of negative body image are mainly distributed in the spring and summer of each year, whereas the local minima are mainly observed in the winter of each year. The national negative body image is impacted by the season and exhibits stable rhythmic fluctuations, which is consistent with the previous study (Griffiths et al., 2021).

The result shows the high consistency of the five psychology professionals' scores of 50 microblog texts in the evaluation of negative body image ($Kendall\ W = 0.666, p < 0.001$). For 500 microblog texts, there was a significant positive correlation between the score of each text and the word frequency ($r = 0.430, p < 0.001$), which met the general criteria for a moderate correlation (Zhao et al., 2016), indicated the reliability of the dictionary.

3. Study 2

In Study 2, we used the panel data of negative body image from Study 1 to compare the differences in negative body image before and after the epidemic, and we used the panel data modeling technique to investigate the influence relationship between the epidemic severity and negative body image.

3.1 Data acquisition

3.1.1 Independent variable

We selected the number of new confirmed COVID-19 cases per month as an indicator of the severity of the epidemic in each province and city. The raw data, which is from the 2019 novel coronavirus epidemic time series data warehouse released by Lilac Garden, covers daily new confirmed cases in all provinces and cities across the country from January 22, 2020 to December 14, 2022. All data of the warehouse are from the national, provincial and regional health commissions. We obtained the monthly data of 31 provinces/municipalities/autonomous regions from January 2020 to May 2022 from the above daily new confirmed cases. However, some provinces and cities have experienced a long period of time with no new confirmed cases per month (such as Anhui Province and Hainan Province). We eliminated provinces with severely missing data and eventually retained 24 provinces/municipalities/autonomous regions for analysis.

3.1.2 Dependent variable

The body image panel data indicated from Study 1 is considered the dependent variable in Study 2. However, the analysis only contained body image data from 24 provinces/cities/autonomous regions.

3.1.3 Control variable

Culture background can have a vast influence on one's body image perception. A large survey study based on adolescents showed that there were significant differences in body dissatisfaction among individuals of different cultures, with Asian American girls and boys showing the most significant body dissatisfaction (Bucchianeri et al., 2016). In this study, individualism and collectivism were included as control variables. We used "the Cultural Value Dictionary" to calculate the collectivism and individualism tendencies of provinces in recent years (Ren et al., 2017). The dictionary is used to measure the attention to others or groups, which has good external validity (Ren et al., 2017) and is widely applied in calculating the level of collectivism and individualism in various periods and regions of China (Huang et al., 2020; Liu et al., 2020; Ren et al., 2020).

3.2 Statistical model and analysis strategy

We selected the data of negative body image in China from 2019 to 2021 for one-way analysis of variance, and briefly compared the differences in negative body image levels between different years before and after the epidemic.

We used a Two-way Fixed Effects model to examine the relationship between the severity of the epidemic and negative body image. The model is given by:

$$Y_{it} = \beta X_{it} + \lambda t + \alpha_i + \varepsilon_{it}$$

Y_{it} represents the dependent variable and is the negative body image in region i at time t .

X_{it} refers to the independent variables, including the new confirmed cases and cultural variables in region i at time t .

λt represents the time fixed effect.

α_i represents the regional fixed effect.

ε_{it} is the error term, which is assumed to be independent and identically distributed.

Since the cross-sectional dimension ($N = 24$) of panel data in this study is smaller than the temporal dimension ($T = 29$), the long panel data model is used in this study. To ensure the robustness of the results, unit root test and cointegration test should be performed before constructing the model. Due to the long time dimension of the model, we tested the possible heteroscedasticity, autocorrelation, cross-sectional correlation of the perturbation term and optimized the model based on the results of the perturbation term test. We applied Z-score normalization to all metrics to eliminate dimensional differences,. The data was analyzed using STATA15.0.

3.3 Analysis and result

3.3.1 Descriptive statistics

Table 1 shows the cross-section correlation of each variable. Negative body image was negatively correlated with the new confirmed cases, but not statistical significant ($r = -0.057$, $p = 0.135$). Furthermore, the correlation results supported the relationship between cultural factors and negative body image. Collectivism ($r = 0.112$, $p < 0.01$) was significantly positively correlated with negative body image, and individualism ($r = -0.153$, $p < 0.01$) was significantly negatively associated with negative body image.

3.3.2 Difference test

To compare the changes in negative body image across the country before and after the epidemic, we conducted a one-way analysis of variance (ANOVA) on the negative body image levels across the country from 2019 to 2021. Results are shown in Table 2. There were significant differences in negative body image between 2019 and 2021 ($F = 6.898$, $p < 0.01$).The post hoc comparison (least significant difference, LSD) was further adopted, and the results were shown in

Table 3. Negative body image was significantly higher in 2019 than in 2020 ($p < 0.01$), while there was no significant difference between negative body image in 2021 and 2020 ($p = 0.131$).

3.3.3 Two-way fixed effect model

We performed panel unit root tests using the LLC method and the optimal lag order of the variables was determined by the BIC criterion. It was found that all time series had no unit root and were stationary series ($p < 0.001$). Kao test was used to test whether there is a cointegration relationship in panel data. The results showed that there was a long-run equilibrium relationship between the variables ($p < 0.001$), and there was no possibility of “spurious regression”.

Subsequently, we conducted the disturbance term tests. Wooldridge’s test confirmed the existence of serial autocorrelation ($F = 116.987$, $p < 0.001$). The Modified Wald test confirmed the existence of heteroscedasticity between groups ($Chisq = 330.67$, $p < 0.001$). According to Pesaran’s CD test, there was a cross-sectional correlation in the two-way fixed effect model ($Chisq = 39.369$, $p < 0.001$).

To address within-group autocorrelation, heteroscedasticity, and cross-section correlation, we constructed a two-way fixed-effects model using Feasible Generalized Least Squares estimation. The model results are shown in Table 4.

After adjusting for time and regional effects, new confirmed cases ($coef = -0.08$, $z = -9.45$, $p < 0.001$) were negatively and significantly predictive of negative body image. The negative body image decreased as more new cases were diagnosed. Individualism ($coef = -0.34$, $z = -24.60$, $p < 0.001$) was a significant negative predictor of negative body image. Collectivism ($coef = 0.12$, $z = 10.16$, $p < 0.001$) had a significant positive predictive effect on negative body image. Compared with individualism, people under the collectivist culture were more likely to have high negative body image.

4. Conclusion and discussion

This study constructed a dictionary of negative body image to reveal the relationship between COVID-19 and body image. The results showed that negative body image declined significantly after the outbreak and remained stable for two years. Although there is no significant cross-sectional correlation between COVID-19 severity and negative body image, COVID-19 severity can negatively predict negative body image after controlling for regional effects and time effects. The negative body image decreased as more new cases were diagnosed.

Terror Management Theory (TMT) posits that self-esteem serves as an effective buffer against death anxiety and fear (Greenberg et al., 1986). When individuals anticipate or experience failure in a

task, they tend to engage in defensive behaviors aimed at bolstering their self-esteem and reducing anxiety and fear (Greenberg et al., 1986). During the COVID-19 pandemic, individuals are experiencing prolonged life-threatening and death stress, which increases the urgency to alleviate death anxiety. Consequently, there may be a greater inclination to utilize various defense strategies aimed at eliminating or repairing the damage caused by COVID-19. The reduction in negative body image can be viewed as a cognitive defense mechanism utilized to enhance self-esteem. Despite the challenges posed by self-isolation policies, inadequate food supply, and other factors that may impede efforts to maintain a slim and fit physique (Bhutani & Cooper, 2020; Brownstone et al., 2022 ; Zeigler, 2021), individuals can safeguard their self-esteem by reducing negative body attitudes and minimizing the risk of setbacks in managing their physical appearance.

This social cognitive bias, rooted in self-protection, is a consequential adaptation of natural selection and holds significant implications for the course of human evolution. Infectious diseases have posed a persistent threat throughout human history, prompting the development of adaptive biases for both social and non-social cognition in response to recurrent environmental pressures (Haselton & Nettle, 2006). The decrease in negative body image may not be a specific response to the COVID-19 pandemic, but rather a stable mechanism that has endured through evolution. For self-centered human beings, judgmental biases serve an instrumental role in maintaining self-esteem or subjective well-being (Crocker & Park, 2003).

Festinger (1954) noted that individuals utilize others as a benchmark for self-evaluation, with the emotions, attention, and recognition received from others serving as crucial sources of personal value. The COVID-19 pandemic has altered social networks and reduced body image-related stress stemming from external evaluations. Lockdown measures and online education have increased social distance among individuals. The lockdown has significantly reduced the pressure to subject oneself to public scrutiny of one's body, while masks have facilitated a greater ease in avoiding the pain of external evaluation and anxiety associated with presenting oneself publicly (Baceviciene & Jankauskiene, 2021; Brownstone et al., 2022). Additionally, there has been a decrease in the internalization of ideal body shape and appearance comparison behavior (Wilhelm et al., 2019). The level of internalization regarding the ideal body shape and comparison behavior related to physical appearance has also decreased (Wilhelm et al., 2019). Furthermore, remote work reduces the need for structured clothing, allowing individuals to be more receptive to various bodily states and less concerned with maintaining a positive body image for professional purposes (Brownstone et al., 2022).

Although this study does not provide evidence for the exacerbation of negative body image by COVID-19, it does not deny the potential threat that COVID-19 poses to both body image and mental

health (Swami et al., 2021; Robertson et al., 2021; Pfund et al., 2020; Pikoos et al., 2021; Nutley et al., 2021). However, negative body image during the pandemic appears to be more prevalent among certain groups who are already preoccupied with appearance anxiety or body shape issues. Studies indicate that COVID-19 only impacts negative body image in individuals with high appearance concerns, while those with low appearance concerns are more likely to alleviate the pressure of social appearance during lockdown (Pikoos et al., 2020). The relationship between body image-related negative mood or depression and body dissatisfaction is moderated by quality of life, but only among obese participants (Czepczor-Bernat et al., 2022).

A potential explanation for intergroup differences is that cognitive strategies may modulate the impact of COVID-19 on health behaviors and body image. Positive individuals who adopt a problem-oriented approach are less likely to experience negative impacts from COVID-19, exhibit fewer maladaptive coping behaviors, and demonstrate higher levels of body appreciation and physical flexibility. Conversely, those with a negative problem-oriented mindset tend to engage in more maladaptive coping strategies, have lower levels of positive body image, and perceive greater negative effects from the pandemic (Starick et al., 2021). If individuals already have a negative body image, COVID-19 is likely to exacerbate this perception and potentially lead to psychological distress and physical symptoms.

Furthermore, the present study provides support for the significant impact of both collectivism and individualism on the perception of body image. On the one hand, Easterners exhibit a stronger sense of interdependent self-construction compared to Westerners, which results in an obligation to conform to socially defined ideals of beauty and creates a discrepancy between the ideal and current self (Madan et al., 2018). On the other hand, collectivist individuals are more susceptible to social influences and seek out social comparisons for the purpose of self-improvement (White & Lehman, 2005). Studies indicate that appearance-based social comparisons serve as a mediator between the use of social networks, body image, and eating disorders (Holland & Tiggemann, 2016). In collectivist societies, women are more prone to comparing their physical appearance with others and may be more susceptible to external opinions when evaluating their own or others' appearances (Jung & Lee, 2006; Madan et al., 2018). In non-Western cultures, appearance management behaviors may be perceived as self-centered and discouraged in comparison to others (Jung & Lee, 2006).

There are some limitations to this study. Body image is influenced by individuals' attitudes towards their own bodies and sociocultural factors (Cafri et al., 2005; Schneider et al., 2023). Different social identities give rise to unique psychological experiences and body images for individuals (Tylka et al., 2015). Therefore, the applicability of negative body image lexicons in non-Chinese contexts remains uncertain, and the efficacy of such lexicons in other countries or regions

requires further investigation. In recent years, positive body image has gained increasing attention due to the vigorous development of positive psychology and cognitive behavioral therapy (Tylka & Wood-Barcalow, 2015). Therefore, it is crucial for future scientific research and policy practice to focus on reducing negative body image and promoting positive body image in order to improve residents' psychological well-being.

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Figure Legends

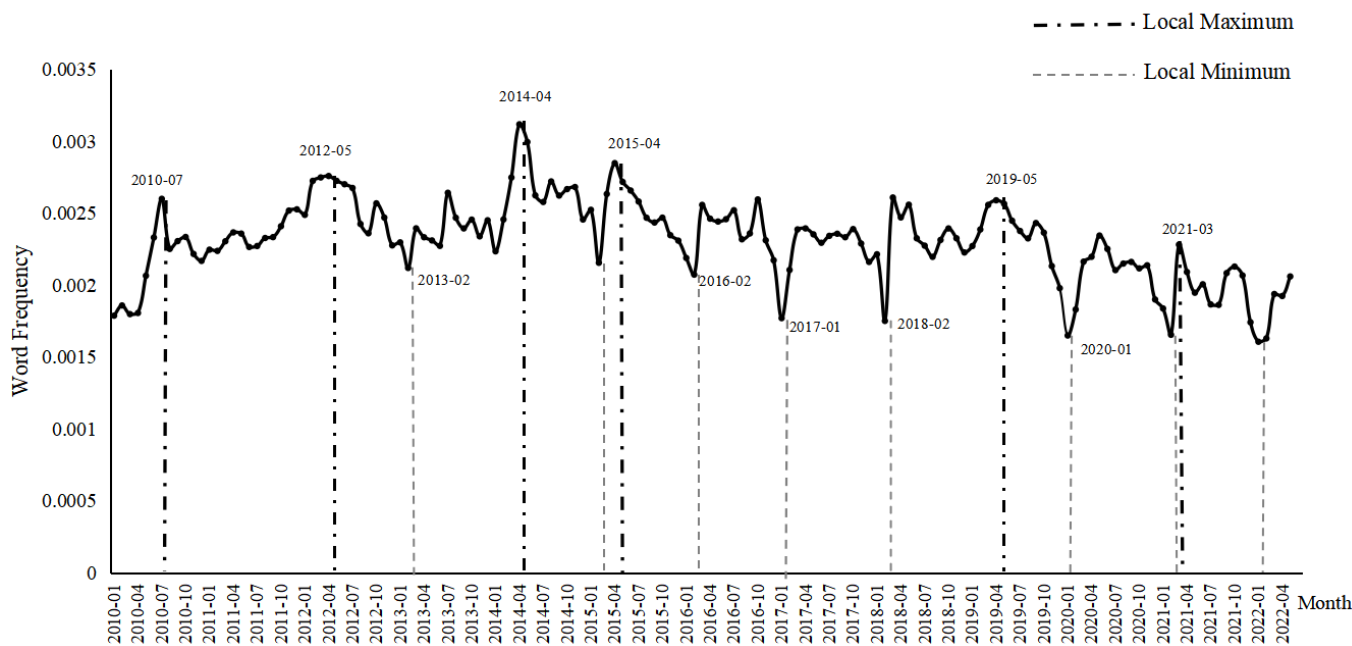


Fig. 1 Seasonal Changes in Negative Body Image

Tables

Table 1 Pearson Correlation Matrix

	Negative Body Image	New Cases	Confirmed	Individualism	Collectivism
Negative Body Image	1				
New Cases	- 0.057	1			
Confirmed	- 0.153**	- 0.076*	1		
Individualism	0.112**	0.074	- 0.061	1	
Collectivism					1

Notes: * $p < 0.05$ ** $p < 0.01$.

Table 2 Difference Test of Negative Body Image from 2019 to 2021

	2019(n=31)	2020(n=31)	2021(n=31)	F
Negative Body Image	0.00236	0.00207	0.00194	6.898**
	±0.0005	±0.0004	±0.0003	

Notes: * $p < 0.05$ ** $p < 0.01$.

Table 3 Post Hoc Comparison Test					
(I)year	(J)year	Mean Difference(I-J)	<i>p</i>	95%Confidence Interval	
				Lower Limit	Upper Limit
2019	2020	0.00030	0.001**	0.00013	0.00047
2019	2021	0.00043	0.000**	0.00026	0.00060
2020	2021	0.00013	0.131	-0.00004	0.00030

Notes: * $p < 0.05$ ** $p < 0.01$.

Table 4 Two-way Fixed Effects Model				
Variable	<i>coef</i>	<i>Std.err.</i>	<i>z</i>	<i>p</i>
New Confirmed Cases	- 0.08	0.0084	- 9.45	0.000
Individualism	- 0.34	0.0138	- 24.60	0.000
Collectivism	0.12	0.0121	10.16	0.000
<i>Wald chi2</i>		1763.75***		
Notes: * $p < 0.05$ ** $p < 0.01$.				

Appendix A

Table A The Negative Body Image Dictionary

Source	Keywords
BES	腿 耳朵 大腿 胳膊 下巴 胸 嘴唇 体型 体格 体味 肩宽 颧骨 二头肌
SCLIWC	衣服 肌肤 身材 屁股 肥 手指 脖子 肌肉 刘海 牙齿 脂肪 服装 毛孔 指甲 膝盖 肩膀 个头 牙 西装 小腿 眉毛 额头 皱纹 长发 短发 上身 大头 臀 腹肌 黑头 胡子 礼服 眼皮 鼻 睫毛 眼袋 唇 容颜 卷发 眼线 手掌 白发 比基尼 光头 脸蛋 颈 小脚 强壮 隐形眼镜 眼角 假发 泳衣 面容 手腕 雀斑 纤细 吊带 面相 脸颊 裸体 毛发 使皮肤 修长 小腹 角质 面色 手肘 乳头 驼背 脚背 胯 秃头 阴道 脚腕 眼圈 穿戴 奶头 踝 脚趾甲 配戴 腮帮子
MBSPQ	眼睛 减肥 头发 肚子 发型 美容 腰 嘴巴 打扮 外观 肤色 整形 丰满 双腿 发胖 双脚 苗条 乳房 脸型 双肩 发质 双臂
NPSS	瘦 胖 矮 长胖 长高
SOQ	皮肤 穿着 体重 身高 外表 长相 外貌 衣着
Additional words from experts	化妆 痘 黑眼圈 口红 装扮 手臂 双眼 服饰 整容 双眼皮 眼影 美甲 腹部 大眼 穿搭 增肥 增高 脱发 眼眶 短腿 减脂 容貌 相貌 小蛮腰 赘肉 长头发 配饰 疤 臂 变胖 肚腩 小肚子 肤质 翘臀 大胸 单眼皮 胡须 脱毛 法令纹 黑皮 燃脂 眼睫毛 圆脸 敏感 肌 细腿 小嘴 发量 瓜子脸 马甲线 生发 医美 龅牙 胡茬 隆鼻 干皮 翘鼻 眼窝 白皮 闭口 黄皮 身型 体态 体脂 细腰 修容 油皮 丰腴 小眼 眼型 植发